EXTRA PRACTICE 28
Multiplying, Dividing, and Simplifying Radical Expressions
Use after Sections 10.3 - 10.5

Name_____

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Examples. Simplify. Assume that all variables represent positive numbers.

a) $\sqrt[3]{320x^6y^4z^2}$

$= \sqrt[3]{64 \cdot 5 \cdot x^6 \cdot y^3 \cdot y \cdot z^2}$

$= \sqrt[3]{64x^6y^3}\sqrt[3]{5yz^2}$

$= 4x^2y\sqrt[3]{5yz^2}$

b) $\sqrt[4]{(81a^8b^4)^2}$

$= \left(\sqrt[4]{3^4a^8b^4}\right)^2$

$= (3a^2b)^2$

$= 9a^4b^2$

c) $\sqrt{\dfrac{75y^5}{16x^2}}$

$= \dfrac{\sqrt{75y^5}}{\sqrt{16x^2}}$

$= \dfrac{\sqrt{25y^4 \cdot 3y}}{\sqrt{16x^2}}$

$= \dfrac{5y^2\sqrt{3y}}{4x}$

Simplify. Assume that all variables represent positive numbers.

1. $\sqrt{20x^3yz^2}$ = _____
2. $\sqrt[3]{128x^4y^2}$ = _____
3. $\sqrt[4]{a^{16}b^{12}}$ = _____
4. $\sqrt{\dfrac{49a^3}{b^4}}$ = _____
5. $\sqrt{45a^3bc^2}$ = _____
6. $\sqrt{16^3}$ = _____
7. $\sqrt[3]{\dfrac{16x^5}{y^6}}$ = _____
8. $\sqrt[4]{64a^7b^{12}}$ = _____
9. $\sqrt{50a^2b^5}$ = _____
10. $\sqrt[5]{(32x^{10})^3}$ = _____
11. $\sqrt{\dfrac{16x^3}{81}}$ = _____
12. $\sqrt{500x^2yz^{11}}$ = _____
13. $\sqrt[3]{216^2}$ = _____
14. $\sqrt[3]{\dfrac{64a^7}{27}}$ = _____
15. $\sqrt[3]{240x^4y^5}$ = _____
16. $\sqrt[4]{x^7y^9z^{12}}$ = _____
17. $\sqrt{\dfrac{24x^3}{25}}$ = _____
18. $\sqrt[4]{256^3}$ = _____

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19. $\sqrt[5]{(32a^5b^{10})^3} =$ _____

20. $\sqrt[3]{(54a^3)^2} =$ _____

Examples. Assume that all variables represent positive numbers.

a) Multiply and simplify.

$\sqrt{32xy^3}\sqrt{4x^2y^5}$

$= \sqrt{128x^3y^8}$

$= \sqrt{64 \cdot 2 \cdot x^2 \cdot x \cdot y^8}$

$= \sqrt{64x^2y^8}\sqrt{2x}$

$= 8xy^4\sqrt{2x}$

b) Divide and simplify.

$$\frac{\sqrt[3]{56a^5b^{14}}}{\sqrt[3]{7ab^5}}$$

$$= \sqrt[3]{\frac{56a^5b^{14}}{7ab^5}}$$

$= \sqrt[3]{8a^4b^9}$

$= \sqrt[3]{8 \cdot a^3 \cdot a \cdot b^9} = 2ab^3\sqrt[3]{a}$

Multiply or divide and simplify. Assume that all variables represent positive numbers.

21. $\sqrt[3]{5(x+2)^2}\sqrt[3]{25(x+2)^2} =$ _____

22. $\dfrac{\sqrt{32a^5b^3}}{\sqrt{2ab^2}} =$ _____

23. $\dfrac{6\sqrt{45x^3}}{3\sqrt{5x}} =$ _____

24. $\sqrt[3]{x^7}\sqrt[3]{64xy^2} =$ _____

25. $\sqrt{8x^3y}\sqrt{3xy^2} =$ _____

26. $\dfrac{\sqrt[3]{81a^5b^8}}{\sqrt[3]{3ab^2}} =$ _____

27. $\dfrac{\sqrt[3]{625x^6y^4}}{\sqrt[3]{5xy}} =$ _____

28. $\sqrt{6(x+3)^3}\sqrt{3(x+3)} =$ _____

29. $\sqrt[3]{6^5a^2b}\sqrt[3]{6^2ab} =$ _____

30. $\dfrac{\sqrt[3]{27xy^7}}{\sqrt[3]{xy}} =$ _____

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31. $\dfrac{9\sqrt[5]{160x^8y^{11}}}{3\sqrt[5]{5xy^2}} =$ _____

32. $\sqrt[3]{4(y-3)^2}\sqrt[3]{2(y-3)^5} =$

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